ERGEBNISSE DER ÖSTERREICHISCHEN NEUKALEDONIEN EXPEDITION. AQUATIC AND SEMIAQUATIC HEMIPTERA

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ABSTRACT—Results of the 1965 New Caledonia Expedition conducted by the University of Vienna. Keys are provided and two new species, *Microvelia* **starmuehlneri** and *Rhagovelia* **pidaxa** are described.

This paper is based on material collected by Dr. F. Starmühlner in New Caledonia in 1965. Although we give locality data for all this material, we also include Dr. Starmühlner's "FNK" numbers. These numbers will facilitate reference to chemical and physical data on the habitats which are being published separately (Cahiers del' ORSTOM, Sect. Hydrobiol.).

The major earlier papers concerning the Hemiptera of New Caledonia were by Montrouzier in Perroud and Montrouzier (1864) and Distant (1914, 1920). The aquatic and semiaquatic Hemiptera were summarized by Lundblad (1933).

Some of the families and genera previously known from New Caledonia are not represented in the material at hand. There are no specimens of Ochteridae although two species should occur there. Jaczewski described *Ochterus australicus* from Australia, New Caledonia and New Hebrides. He noted that Montrouzier's *O. dufouri* (type-locality, New Caledonia) might be synonymous with *O. marginatus* Latreille but that it was distinct from *O. australicus*. Of the true aquatics, *Lethocerus insularis* (Montandon) and *Plea liturata* (Fieber) (= *P. rufonotatus* Distant) are not represented.

The genus *Ochthecorisa* remains an enigma. It was described by Montrouzier in 1864 from New Caledonia with the remarks that it did not seem to be separable from *Hebrus*, that it walked upon the surface of stagnant and running water like the "Hydrometres" and ran upon land with great agility. He also stated that according to the current classification of authors it belonged in the Anthocoridae. For reasons unknown to us the Lethierry and Severin catalog places this genus in the Veliidae, where it remains. *O. austrocaledonica* Montrouzier, the only included species, is described almost solely on the basis of color, being velvety black or greenish black with the base

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of the pronotum, elytra and tarsi yellowish white, sternum and abdomen greenish white. Size is given as 3 mm.

Family GERRIDAE

KEY TO THE SPECIES OF **Limnogonus** OF NEW CALEDONIA

1. Yellow lateral lines on mesopleura tapering posteriorly ..... **fossarum** (F.)
   Yellow lateral lines on mesopleura widened posteriorly, truncate ..... **luctuosus** (Montrouzier)

In his Tahitian paper, Lundblad (1934) illustrated the coloration of the mesopleura and also the structures of the aedeagus of these two species. New Caledonia specimens before us match his figures very well. Both *fossarum* and *luctuosus* are widespread in the Pacific region.

Limnogonus fossarum (F.)

Cimex fossarum F., 1775, Syst. Ent. p. 727. (India)
Gerris discolor Stal, 1859, Kongl. Svenska freg. Eugenies, Zool. 4:265
Tenagonus nymphae Esaki, 1925, Philipp. J. Sci. 26:58.

Material examined: 1♂, 2♀, 2n, FNK 46, Koh River, Koh village, 29-vii-65; 2♂, 1♀, 1n, FNK 68, Nepoui River, lower course, 13-viii-65; 1♀, FNK 48, Negropo River, lower branch, 29-vii-65.

Limmnogonus luctuosus (Montrouzier)

Gerris luctuosa Montrouzier, 1864, Ann. Soc. Linn. Lyons 11:242 (New Caledonia).

Material examined: 1♀, FNK 71, Rivière de Lacs, Nouméa-Yaté Rd., 17-viii-65; 2♀, FNK 79, Ouarau Brook, branch of Tchamba River, 25-viii-65; 2♂, FNK 44, La Farino River, Farino village, 28-vi-65; 1♀, FNK 80, Tchambo River, middle branch, 20-viii-65; 2♀, 1n, FNK 28, Blanche River Swamp, 22-vii-65; 1♀, FNK 22, Pirogue River, 5 km. W. Forest Station, 20-vii-65; 1♀, FNK 72, Pernod Creek, Nouméa-Yaté Rd., 17-viii-65; 1♀, FNK 52, Sarramea River, Sarramea village, 30-vii-65; 1♀ FNK 36, Fonwhary River, La Foa-Col d'Amieu Road, 26-vii-65; 1♀, FNK 9, Dumbéa River, 1 km. below dam, 15-vii-65; 1♀, FNK 110, Koumac-Ouégona Road, pond, 18-ix-65; 1♂, 2♀, 1n, FNK 49, Negropo River, lower branch at Negropo School, 29-vii-65; 1♂, FNK 35, brook, La Foa-Col d'Amieu Road, 25-vii-65; 1♂, FNK 42, Tindia River, NW Farino, 28-vii-65.

Family VELIIDAE

Halovelia loyaltiensis China

Halovelia loyaltiensis China 1957, Jour. Linn. Soc. (London), Zoology 43:354 (Loyalty Islands).

This odd species of *Halovelia* is the only one known with the anterior and posterior femora incrassate in the male. The following is the first record since the original description.

Material examined: 2♂, 2♀, FNK 90, Hienghène River, 10 km. from its mouth, 3-ix-65.

KEY TO THE SPECIES OF **Microvelia** OF NEW CALEDONIA

1. Small (1½ mm.); pronotum margined with orange yellow both posteriorly and anteriorly; 4th antennal segment almost twice as long as 3rd ..... **oceanica** Distant

Larger (2 mm.); pronotum with orange yellow spot along anterior margin only; antennal segments 3 and 4 subequal ..... **starmuehlneri**, n. sp.

Microvelia oceanica Distant

Microvelia oceanica Distant, 1914, *in* Sarasin and Roux, Nova Caledonia, Zoologie 1, L. 4, No. 10:383. (New Caledonia).

This species is apparently endemic to New Caledonia and the Loyalty Islands. Material examined: 2♂, 3n, FNK 94, Hienghène River, at Kavatch village, 8-ix-65; 1♂, 1n, FNK 15, Dumbéa River dam, 15-vii-65; 3♂, 2♀, 1n, FNK 16, Dumbéa River, 2 km. above rte. 1, 18-vii-65; 1♂, 2♀, FNK 44, La Farina River, Farino village, 28-vii-65.

Microvelia starmuehlneri, n. sp.
(Fig. 1A, B, C)

Apterous male: Robust, elongate; ground color black; fore lobe of mesonotum with broad median brown area, posterior lobe blackish brown, broad areas near lateral margins of terga 1, 2, 3 and 7, light gray; connexiva margined with brownish black; venter brownish black, pleura tinged with deep brown, proepisternum brown; coxae, trochanters, base of femora, yellowish; remainder of legs brown. Entire body covered with short, semi-erect pubescence, longer on anterior portion of head.

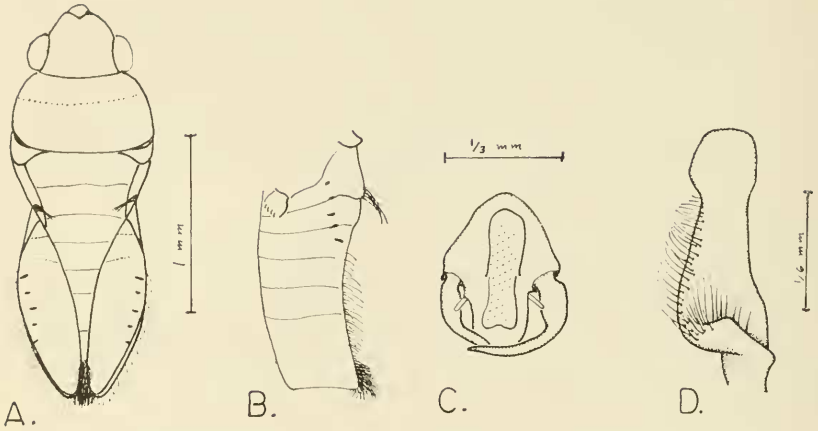
Head without median sulcus; eyes not prominent; rostrum reaching beyond anterior coxae. Pronotum long, covering all but posterolateral angles of mesonotum; anterior lobe: posterior lobe, 7: 17[2]; length: width, 24: 45. Tergum 1 longer than 2 (12: 11), terga varying little in length, (range 8–11), tergum 7 long (20). Connexiva vertical, almost parallel along terga 1–5, tapering evenly to apex from terga 5; first genital segment broad (25) and short (11), glabrous except anterolaterally.

Sterna 5–7 with median black longitudinal stripe; sternum 7 depressed medially. First genital segment short ventrally (3), second extending to tip of first; genital capsule and parameres as in fig. 1C.

Antennae brown; length of segments I–IV, 12: 12: 16: 22; all segments thickly covered with pubescence subequal in length to width of segment II, and scattered longer hairs. Tibial comb on fore tibiae very short. Fore femora slightly swollen, with a row of 12 evenly spaced anteroventrally directed bristles; flattened and glabrous on anterior face. Measurements of legs as follows:

	femur	tibia	tarsal 1	tarsal 2
Anterior	37	25	15	–
Middle	43	36	11	13
Posterior	43	52	11	14

[2] For all measurements, 60 units = 1 mm.



Figs. 1 A–C, *Microvelia starmuehlneri*, n. sp. A, female, dorsal aspect; B, same, side view; C, male, dorsal aspect of genital capsule. Fig. 1 D, *Rhagovelia pidaxa*, n. sp., male paramere.

Apterous female: Approximately equal in size to male, body shape as shown in figs. 1A, B. Connexiva margined with yellowish brown, sharply folded over edge of abdomen, flattened onto the depressed medial portion of abdominal dorsum, intersegmental sutures barely evident, spiracles of segments 4–6 lying on dorsal surface. Venter slightly shining, more so on lateral portions of segments 2 and 3. Other characters similar to those of male. Length 2.2 mm., width .8 mm.

Material examined: Holotype ♂ (USNM No. 70681), Allotype ♀ in U. S. National Museum, 20♂, 23♀ paratypes, 1 nymph, FNK 38, spring on Mt. Dogny, 27-vii-65; 7♂, 4♀ paratypes, 4n, FNK 39, Mt. Dogny, stream off Sarramea River, 27-vii-65.

Paratypes are in the U. S. National Museum; J. T. Polhemus collection and the Naturhistorisches Museum, Vienna.

In Lundblad's (1933) key to the *Microvelia* of the South Pacific region, this species runs to the *horvathi-douglasi* couplet; however both of those species are much smaller than *starmuehlneri*, the right parameres of both project caudad while in *starmuehlneri* they cross and the female abdomens are not modified.

In the female of *starmuehlneri* the abdomen is concave and fits the venter of the male very closely, presumably to facilitate mating. In addition, the anterior segments of the female abdomen are somewhat compressed laterally and slightly glabrous on the sides, indicating that the male's legs grasp this area. The male on the other hand has the anterior face of the fore femora and apex of the fore tibiae flattened and glabrous and a ventral median depression on the seventh abdominal segment to accommodate the hair tuft at the apex of the female abdomen.

These modifications set this species off from all other microvelias, although other species are known with various modifications to facilitate the male riding "piggy-back." Esaki (1937) noted that almost all of the females of *Microvelia notophora* Esaki (from the Palaus) carried males on their backs, but none was seen mating.

KEY TO THE SPECIES OF **Rhagovelia** OF NEW CALEDONIA

1. Anterior two-thirds of pronotum with yellowish stripe attaining lateral margins; each tergum with broad yellowish brown spot; anterior trochanter of male without prominent spine; first genital segment not strongly constricted laterally ..... **pidaxa**, n. sp.
   Slightly more than half of the pronotum with yellowish stripe reaching halfway to lateral margins, terga without yellowish brown spot; anterior trochanter with a long, anteriorly directed spine; first genital segment strongly constricted laterally ..... **novacaledonica** Lundblad

Distant's records (1914, 1920) of *nigricans* (Burmeister) from New Caledonia were misidentifications. The specimens that he examined (Distant Collection, British Museum) form the type series of Lundblad's *novacaledonica.*

Rhagovelia novacaledonica Lundblad

Rhagovelia novacaledonica Lundblad, 1936, Arkiv För Zoologi 28A (21):9–12, pl. 2 (New Caledonia).

The females of this species are quite variable, some matching Lundblad's figure very well, others have the apical segment of the connexivum reflexed and still others have the hair tufts on the genital segments almost wanting. All specimens examined were apterous.

Material examined: 1♀, 18n, FNK 29, Mt. Pouédihi, brook, 22-vii-65; 3♂, 3♀, 4n, FNK 19, Mouirage Mt., St. Louis—Yaté Rd., 20-vii-65; 4♀, 1n, FNK 105, Diahot R., at Ouénia, 16-ix-65; 2♂, 4♀, 3n, FNK 44, La Farino R., Farino village, 28-vii-65; 1♀, 2n, FNK 66, Poya R. at Ndokoa Gorge, 12-viii-65; 7♂, 2♀, 6n; FNK 37, Koh River, forest station, 26-vii-65; 1♂, 1♀, 78n, FNK 46, Koh River, Koh village, 29-vii-65; 3♂, 4♀, 5n, FNK 62, Neklia River, 5 km. from Mission Station, 10-viii-65; 1♂, 2♀, 16n, FNK 79, Ouarau Brook, branch Tchamba River, 25-vii-65; 10♂, 4♀, 14n, FNK 42, Tindia River, NW Farino, 28-vii-65; 1♂, 13n, FNK 9, Dumbéa River, 1 km. below dam, 15-vii-65; 3♂, 1♀, 2n, FNK 121, Toili River, Col d'Amieu, 27-ix-65; 1♂, 1♀, 3n, FNK 31, Mt. Pouédihi, brook at loghouse, 22-vii-65; 1♂, 1♀, 2n, FNK 24, Bleue River bridge, 21-vii-65; 1♀, 6n, FNK 111, Stream, Néhoué River on Koumac-Ouégoua Rd., 18-ix-65; 3♂, 3♀, 14n, FNK 59, Thir (or Thy) River, 5-viii-65.

Rhagovelia pidaxa, n. sp.
(Fig. 1D)

Apterous male: Moderately large; dark, ground color blackish brown; covered with short brown depressed pubescence; anterior two-thirds of pronotum, coxae, trochanters, upper two-thirds of connexiva, anterior part of head, anterior faces and basal half dorsally of fore femora yellowish to light yellowish brown; central portion of each abdominal tergum and disc of fore lobe of mesonotum yellowish brown; caudal margins and sides of abdominal sterna, except for narrow lateral median stripe, black.

Antennae long, slender, segment one set with about 12 long slender spines, each as long as diameter of segment, curved, basal fourth yellow; segment 2 with two slender spines at apical two-thirds; all segments thickly covered with very short pile; antennal ratio I–IV, 28: 18: 21: 16. Rostrum reaching beyond

front coxae, stout. Head with median shining furrow, convex, a row of long curved hairs bordering eyes.

Pronotum rectangular, much shorter than fore lobe of mesonotum (18: 46). Hind lobe of mesonotum short (10). Body and tergite shape as in *Rhagovelia novacaledonica*. Apex of connexiva with a tuft of stiff brown hairs.

Proepisternum with a field of tiny conical black setae behind jugum of head; each abdominal sternum laterally with two (2 + 2) slightly depressed black areas, one near anterior margin and one near posterior margin, each having minute glabrous depressed spots, these areas lie just below the yellow band of the connexivum and have a length subequal to the width of the band.

Legs stout; all femora sparsely set with strong black spine-like hairs; hind femora and trochanters armed as in *novacaledonica*, i.e., with several short teeth on trochanters and three irregular rows of short teeth along entire length of posterior face of femora. Proportions of legs:

	femur	tibia	tarsal 1	tarsal 2
Anterior	32	35	9	–
Middle	53	42	22	20
Posterior	50	56	7	8

Genital segments large, subequal to last abdominal tergum (32: 30); first genital segment beneath slightly depressed, subequal to second. Paramere (fig. 1D) very similar to that of *novacaledonica*.

Length 4.65 mm., width across humeri 1.7 mm.

Apterous female: Broader than male. Venter lighter in color, with only anterior lateral depressed spot (1 + 1) on each abdominal sternum black. Abdominal segments 2–8 of approximately equal length (8); genital segment short (5); posterior femora armed on apical half or three-fourths. Other characters as in male.

Length 5.25 mm., width across humeri 1.85 mm.

Macropterous form: unknown.

Material examined: Holotype ♂ (USNM No. 70682), allotype ♀ in the U. S. National Museum, 4♂, 10♀ paratypes, FNK 38, spring, Mt. Dogny, 27-vii-65. Paratypes in the collections of U. S. National Museum, J. T. Polhemus and the Naturhistorisches Museum, Vienna.

In Lundblad's (1936) key to the Old World species of *Rhagovelia*, this species keys to *novacaledonica* but is clearly not that species. In addition to the characters given in our key above, *novacaledonica* has the minute conical setae on the proepisternum arranged in a thin line behind the antennal nodule and eyes whereas in *pidaxa* there is a field of setae behind the jugum of the head.

Both species are apparently endemic to New Caledonia.

Family Hydrometridae

Key to the Species of **Hydrometra** of New Caledonia

1. Venter of male with laterally directed hair tufts near posterior margin of last abdominal segment, in addition to processes near anterior margin of same segment; abdomen slender, straight ..... **risbeci** Hungerford

   Venter of male without laterally directed hair tufts near posterior margin of last abdominal segment; abdomen more robust, dorsoventrally curved ..... **aculeata** Montrouzier

Hydrometra risbeci Hungerford

Hydrometra risbeci Hungerford, 1938, Pan-Pac. Ent. 14:81 (New Caledonia).

This species is known from Australia, New Caledonia and Tahiti.

Material examined: 1♂, FNK 35, brook, La Foa-Col d'Amieu Road, 25-vii-65.

Hydrometra aculeata Montrouzier

Hydrometra aculeata Montrouzier, 1864, Ann. Soc. Linn. Lyon 11:240 (New Caledonia).

This species is apparently endemic.

Material examined: 1♂, 1♀, FNK 64, stream at Col de Boa, 11-viii-65; 1♀, FNK 22, Pirogue River, 5 km. w. Forest Station, 20-vii-65; 1♀, FNK 15, Bleue River, 17-vii-65; 1♂, FNK 38, spring, Mt. Dogny, 27-vii-65; 2♀, 2n, FNK 85, Néavin River, 3 km., Néavin village, 29-viii-65; 2♂, 2♀, FNK 110, Koumac-Ouégoua, pond on road, 18-ix-65; 1♂, 2♀, FNK 121, Toili River, Col d'Amieu, 27-ix-65; 5♂, 2♀, FNK 22, Sarramea River, Sarramea village, 30-vii-65; 1♂, 4♀, FNK 42, Tindia River, NW Farino, 28-vii-65; 9♂, 8♀, FNK 44, La Farino River, Farino village, 28-vii-65; 1♀, FNK 35, brook, La Foa-Col d'Amieu Road, 25-vii-65; 1♂, FNK 9, Dumbéa River, 1 km. below dam, 15-vii-65.

Family MESOVELIIDAE

Mesovelia vittigera Horvath

Mesovelia vittigera Horvath, 1895, Rev. d'Ent. 14:160 (Egypt).

Mesovelia orientalis Kirkaldy, 1901, Mus. Civ. Stor. Nat. Genova, Ann. II, 20:808.

Mesovelia orientalis has been treated as a distinct species by most authors including Lundblad 1933, but it was synonymized with *vittigera* by Jaczewski in 1936 and we concur.

This widespread species apparently has not been recorded from New Caledonia previously.

Material examined: 1♀, FNK 16, Dumbéa River, 2 km. above Rt. 1, 18-vii-65.

Family LEPTOPODIDAE

Valleriola assouanensis (Costa)

Leptopus assouanensis Costa, 1875, Atti R. Acca. Sci. Fis. Mat., Napoli 7:9 (Egypt).

This species is known from Egypt, Ceylon, Persia and India but has not been recorded from New Caledonia previously.

Material examined: 2♂, FNK 5, s. branch Dumbéa River, 15-vii-65.

Family CORIXIDAE

Sigara tadeuszi Lundblad

Sigara sublaevifrons Jaczewski, 1931, Archiv fur Hydrobiol. 23:507 (Australia). (New species, fully described but erroneously considered to be *Arctocorisa sublaevifrons* Hale, 1922, Rec. S. Australian Mus. 2:316.)

Sigara tadeuszi Lundblad, 1933, Archiv für Hydrobiol., Suppl.-Bd. 12, Tropische Binnengewässer 4:81. (New name for *sublaevifrons* Jaczewski.)

Sigara haeli Hungerford, 1934, Bull. Brooklyn Ent. Soc. 29:69. (Unnecessary new name for *sublaevifrons* Jaczewski.)

Dr. I. Lansbury has kindly studied the New Caledonia material and states that it is very close to or identical with *tadeuszi*. The only other *Sigara* that he has seen from New Caledonia is *truncatipala* Hale. Dr. Lansbury has a revision of the Australian *Sigara* in press which will include the New Caledonia area.

Material examined: 1♀, 2n, FNK 118, Ile des Pins, Galilee River, 22-ix-65; 2♂, 4♀, 7n, FNK 113, Ile des Pins, Wouintoureu Groto Creek, 22-ix-65; 1♀, 1n, FNK 16, Dumbéa River, 2 km. above Route 1, 18-vii-65.

Family NOTONECTIDAE

KEY TO THE SPECIES OF **Anisops** (males) OF NEW CALEDONIA

1. Synthlipsis wide, one-third or more the anterior width of vertex 2
   Synthlipsis narrow, less than one-third the anterior width of vertex ..... **crinita** Brooks
2. Greatest width of head more than seven times the anterior width of vertex ..... **cleopatra** Distant
   Greatest width of head less than seven times the anterior width of vertex .. 3
3. Synthlipsis one-half or more anterior width of vertex; over 6.5 mm in length ..... **occipitalis** Breddin
   Synthlipsis less than one-half anterior width of vertex; less than 6.5 mm. in length ..... **hyperion** Kirkaldy

None of the above species is endemic to New Caledonia. Only one is present in the material at hand.

Anisops cleopatra Distant

Anisops cleopatra Distant, 1914, *in* Sarasin and Roux, Nova Caledonia, Zoologie 1, L. 4, No. 10:386, pl. 11, fig. 8 (New Caledonia).

This handsome species is presently known from New Caledonia, Java, Guam, Samoa and Sumatra.

Material examined: 1♂, 2♀, FNK 46, Koh River, Koh village, 29-vii-65; 2♂, 3♀, FNK 8, Dumbéa River dam, 15-vii-65; 1♂, 1♀, FNK 16, Dumbéa River, 2 km. above Route 1, 18-vii-65; 1♀, FNK 62, Neklia River, 5 km. from Mission Station, 10-viii-65; 1♀ FNK 110, Koumac-Ouégoua, pond on road, 18-ix-65; 1♀, FNK 44, La Farino River, Farino village, 28-vii-65.

Enithares bergrothi Montandon

Enithares bergrothi Montandon, 1892, Rev. d'Ent. 11:75 (New Caledonia).

Until recently this species was known only from New Caledonia. Lansbury (1968) mentions a single specimen in the Natural History Museum, Paris from Lifu, Loyalty Islands which he has provisionally named as this species.

Material examined: 1♂, 1♀, FNK 115, Pirogue River, 5 km. w. Forest Station, 20-vii-65; 1♀, 1n, FNK 111, Stream, Nehoue River on Koumac-Ouégoua Road, 18-ix-65; 1♀, FNK 38, spring, Mt. Dogny, 27-vii-65; 1n, FNK 9, Dumbéa River, 1 km. below dam, 15-vii-65; 1♂, 1♀, 1n, FNK 85, Néavin River, 3 km. Néavin village, 29-viii-65; 1♂, 2♀, FNK 64, stream at Col de Boca, 11-viii-65; 1♀,

FNK 47, warm springs at Le Crouen, 29-vii-65; 1♀, 1n, FNK 71, Rivière de Lacs, Nouméa Yaté Road, 17-viii-65; 1♂, FNK 49, Negropo River, lower branch at Negropo School, 29-vii-65; 1♂, FNK 42, Tindia River, NW Farino, 28-vii-65; 1♂, 4♀, 2n, FNK 37, Koh River, Forest Station, 26-vii-65; 1♀, 1n, FNK 46, Koh River, Koh village, 29-vii-65; 2♀, 12n, FNK 52, Sarramea River, Sarramea village, 30-vii-65; 9♂, 4♀, 2n, FNK 110, Koumac-Ouégoua Pond on road, 18-ix-65; 1♂, 1n, FNK 116, Creek, Wapan River, 22-ix-65; 1♂, 1n, FNK 36, Fonwhary River, La Foa, Col d'Amieu Road, 26-vii-65; 1♂, 5♀, 5n, FNK 121, Toili River, Col d'Amieu, 27-ix-65; 6♂, 4♀, 3n, FNK 44, La Farino River, Farino village, 28-vii-65.

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